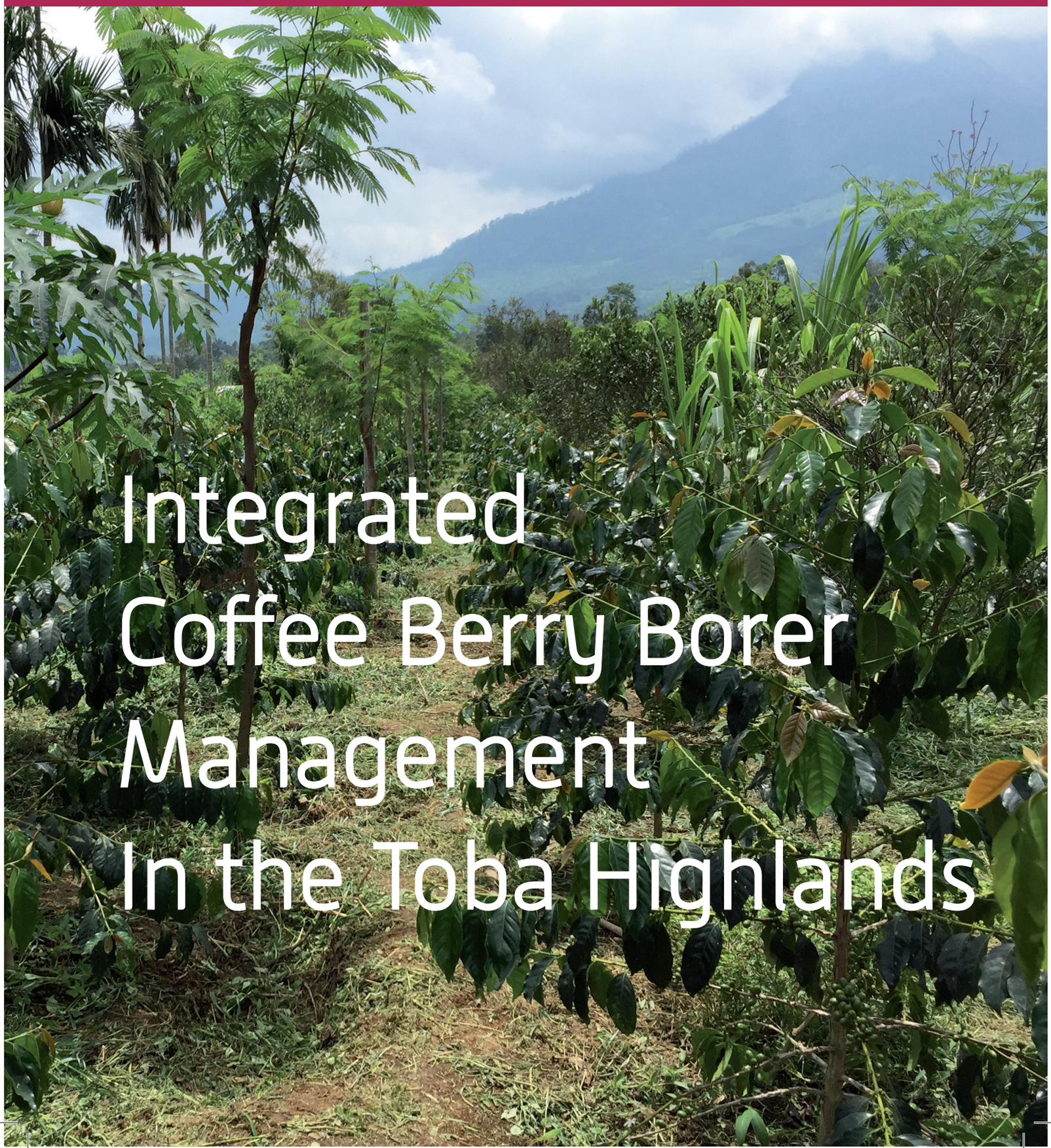
cirad
AGRICULTURAL RESEARCH
FOR DEVELOPMENT

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
AMBASSADE DE FRANCE
EN INDONÉSIE
ET
AU TIMOR ORIENTAL

PT INDO CAFCO / ECOM COFFEE GROUP
INDONESIA



Integrated Coffee Berry Borer Management In the Toba Highlands

The Coffee Berry Borer *(CBB* Hypothenemus hampei *(Ferrari) is the most destructive pest of coffee as it attacks the fruit itself and induces a sizeable reduction in the production of healthy berries.*

The specific equatorial highland climate of the ***Toba region (North Sumatra Province)****, which brings regular showers, induces several successive blooms over the year and continuous fruiting on which the CBB grows until the last harvest passes.*

The latest CBB studies undertaken by the joint CIRAD-Indo CafCo research group in the Toba region have shown that Integrated Pest Management (IPM) can be successfully used to control CBB populations affecting Arabica coffee plantations. This form of control is achieved without any use of insecticide and it has been found to reduce infestation rates to economically acceptable levels. In addition, the proposed programme incorporates joint actions, which are aimed at significantly increasing coffee production.

Main components

- **1.** SANITATION HARVESTING,
- **2.** BASIC AND PRODUCTION PRUNING AND SUCKERING,
- **3.** TRAPPING THROUGHOUT THE ENTIRE FRUITING PERIOD,
- **4.** CONTROLLING CBB MIGRATION FROM PULPING AND DRYING AREAS.

Other components

- **5.** APPLICATIONS OF AN AQUEOUS SUSPENSION OF *BEAUVERIA BASSIANA*,
- **6.** MANUAL WEED CONTROL AND GROUND CLEANING,
- **7.** MONITORING OF CBB INFESTATIONS.

Stripping berries off the branches

Picking berries off the ground

1 SANITATION HARVESTING

> This activity consists in eliminating and destroying all (green, red and black) infested berries from the coffee trees (stripping), and picking up and destroying the berries fallen on the ground. The right moment for this operation is at the end of the peak season of harvesting and more precisely less than three months after the two major annual blooms.

Basic pruning with topping

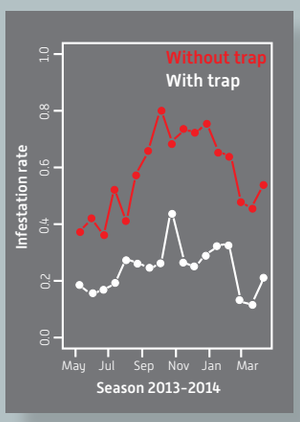
Production pruning

2 PRUNING AND SUCKERING

> Basic Pruning, including topping, enables the generation of a canopy that is better adapted to harvesting work. This operation is carried out between May and June, if necessary.

> Production pruning consists in eliminating dead and unproductive branches in order to restore vigorous growth. This operation is carried out in December, usually once every two years.

> Suckering is practiced when required.



Differences in infestation with and without trap

BROCAP© trap

3 TRAPPING

> Trapping alone with 25 BROCAP© traps/ha reduces infestations by half. Its effectiveness can be increased when each plantation is protected from intrusions by external CBBs by a trap line around the edge. Traps must work all year round.

Coffee drying

Trapping in a drying area

4 CONTROLLING CBB MIGRATION FROM PULPING AND DRYING AREAS

> **Warning!** The pulping and drying of infested coffee continually releases CBB females, which migrate to the plantations thus jeopardizing any control operations. Female insects must be captured with BROCAP© traps installed close to the pulping and drying areas, one to three per area, and throughout the post-harvest work.

Treatment with B. bassiana

5 CONTROL WITH *BEAUVERIA BASSIANA*

> Active strains of *B. bassiana* attacking CBB are formulated as a wettable powder. Mixed with water, the resulting suspension is applied using a manual sprayer, at a rate of 1 kg of powder/ha twice or three times a year, when migrations increase.

Weed control and cleaning

6 MANUAL WEED CONTROL AND GROUND CLEANING

> These activities are at the heart of healthy coffee plantations and are part of the usual agronomic tasks that growers carry out in a timely manner.

7 MONITORING OF CBB INFESTATION

> The average rate of infestation can be defined through a visual count of all healthy and infested berries on fifty branches (or more) taken at random in a plot. This rate can be checked several times a year.

> What is the role and cost of each component of IPM?

• Sanitation harvesting is the simplest component to be carried out. It does not involve any material cost. Destruction of the infested berries collected (with boiling water for example) prevents the emergence and the colonization of new berries by CBB females.

• Pruning and suckering are tasks related to coffee growing. They have no strong effect on CBB control. However, they participate in the rejuvenation of coffee trees and in a significant increase in production.

• The role of trapping is to capture the largest possible number of colonizing females, regardless of their origin in the plantation. The traps are usable for several years, so their annual cost is low. Only the attractant dispensers have to be renewed every two months.

• Given the very wide dispersion of pulping and drying areas, permanent CBB trapping near these areas prevents their return to plantations.

• Treatment with *B. bassiana* is complementary control aimed at destroying CBBs when they are attacking berries.
Its cost is related to the number of applications.

• Weed control and ground cleaning contribute to easier sanitation harvesting operations and various agronomic activities including harvesting.

• Monitoring of CBB infestations helps in decision-making for better control.

In the Toba region, PT. Indo CafCo's Sustainable Management Services (SMS) actively promote sustainable Arabica coffee cultivation and engage their producers in an Integrated Pest Management Programme to control the Coffee Berry Borer (CBB). At their Farmer Training Centre (FTC) in Toba, they invite producers to attend training sessions in Good Agricultural Practices and visit demonstration plots and a nursery. As part of their sustainable initiative, they provide Brocap traps and customized technical assistance to their producers for the highest positive impact on their farms.

> What are the advantages of IPM?

- IPM is a preventive strategy: it controls CBBs before they infest the crop and cause damage,
- It helps to limit yield losses,
- It is simple to apply,
- It contributes to sustainable and environment-friendly farming,
- It is compatible with the use of biological agents other than *B. bassiana,* such as parasitoid Hymenoptera,
- It does not affect biodiversity.

For general information,
technical assistance and sale of BROCAP© traps,
contact our specialists:

> Yuliana DolokSaribu
SMS PT Indo CafCo Medan,
ydoloksaribu@ecomtrading.com
+626180862929

> Wagianto Wagianto
SMS PT Indo CafCo Lampung,
wagianto@ecomtrading.com
+62721350737

> I Wayan Kerana
SMS PT Indo CafCo Medan,
wkerana@ecomtrading.com
+628116201010

> Bernard P. Dufour
Scientific Officer CIRAD France,
bernard.dufour@cirad.fr
+33467593710

IPM training in a smallholder environment

Arabica coffee plantation with Mount Sinabung in the background

cirad
AGRICULTURAL RESEARCH
FOR DEVELOPMENT

42, rue Scheffer
75116 Paris
France
Tél. : (+33) 1 53 70 20 00

www.cirad.fr

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

AMBASSADE DE FRANCE
EN INDONÉSIE
ET
AU TIMOR ORIENTAL

PT INDO CAFCO / ECOM COFFEE GROUP
INDONESIA

Photos: CIRAD - Indo Cafco
Graphic design: Delphine Guard-Lavastre,
Communication Service
December 2018

Printed by: Impactimprimerie (34)